The Impact of the Great Recession on Charitable Giving

Abstract: Since the onset of the Great Recession in December of 2007, the demand for private charity has increased. This paper seeks to test whether key determinants of private giving changed because of the Great Recession. Using state-level panel data for 1995 to 2011, the paper analyzes the determinants of the average charitable contributions of itemizing taxpayers both before and after the Great Recession. The results show that the Great Recession caused significant shifts in the determinants of charitable giving. We find that unemployment, poverty, and changes in the S&P 500 have decidedly different effects on giving following the recession compared to pre-recession years.

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I. INTRODUCTION

Most Americans believe that private charity advances the collective well-being of society. However, the consequences/benefits of government welfare programs are widely debated. Charity is a multi-billion dollar industry in the United States and the aggregate contribution levels are growing. A 2014 study by Giving USA analyzing data from the National Center for Charitable Statistics reports that Americans contributed an aggregate total $335.17 billion to charity in 2013, the most recent year for which this data is available. These contributions represent about 2% of United States GDP and 72% of these donations were from individuals rather than corporations or foundations. The highest percentage of contributions went to religious and education-related charities (31% and 16%, respectively).

List (2011) shows that "charitable giving has nearly doubled in real terms since 1990 and the number of nonprofit organizations registered with the IRS grew by nearly 60 percent from 1995 to 2005" (List 157). Aggregate donation levels have continued to grow over the past few decades, even during periods of economic hardship. Nevertheless, charitable giving differs widely across states. High-income states with lower rates of poverty and unemployment (i.e. Massachusetts) appear less charitable relative to low-income states with higher levels of poverty (i.e. Alabama).

This relation between hardship and charitable giving is critical as charities have often served as a crucial lifeline for individuals on the brink of financial or personal tragedy. While contributions fell following the Great Recession, contributions increased 12.3% since the official end of the Great Recession in 2009. While aggregate donations may increase during hardship, the relation between determinants of giving and donations may also change. For instance, changes in unemployment and poverty may have different effects on giving during times of

economic hardship. Even if the shift in the relation between economic indicators like the unemployment rate and charitable giving is relatively modest, the overall impact on giving behavior can be quite large. The Great Recession that began in 2007 caused the unemployment rate to rise from 4.4% in May 2007 to 10.0% in October 2009. Worse yet, the unemployment rate stayed above 6.0% until August 2014 roughly seven years from the onset of the recession.

Indeed, our results show that the Great Recession caused significant shifts in the determinants of charitable giving. We find that unemployment, poverty, and changes in the S&P 500 have decidedly different effects on giving following the recession compared to pre-recession years.

II. LITERATURE REVIEW

A series of papers consider the determinants of charitable giving. Charity is affected by individuals' desire for peer approval, changes relative to the S&P 500 index, the affiliation of charitable organizations, and demographic factors. While this information is useful, what is notably absent is a comprehensive multivariate regression that attempts to quantify the impact of the Great Recession on individual generosity.

List (2011) documents the relation between the change in the S&P 500 and the change in aggregate charitable giving over time. A simple regression of the *percentage change* in charitable giving on the previous year's *percentage change* in the S&P 500 shows that a 1% increase in the index predicts a 0.19% increase in charitable giving. An impressive 40% of the variation in the percentage change in charitable giving is explained by percentage changes in the S&P 500 alone (List 160-161).

A visual inspection of charitable giving over time reveals that while aggregate charitable giving has changed along with the overall index, it is "sticky downwards." According to List

(2011), a period of decline in the stock market causes less of a downward shift in aggregate

contributions relative to the relative increase in charitable contributions in a period of economic

growth. More importantly, a regression of percentage changes in charitable giving on other

factors such as GDP, consumption expenditures, and unemployment shows a similar asymmetric

effect. Charitable giving increases substantially with increases in GDP and decreases in

unemployment. However, charitable giving falls only modestly with decreases in GDP and

increases in unemployment.

Bakija and Heim (2011) show that income taxation policies significantly influence

charitable generosity amongst Americans. Donations to charitable organizations, including those

with a religious affiliation, are generally deductible at the federal and state levels (in states that

impose taxes on personal income). Their study finds that people change their charitable

donations in advance of large future changes in federal marginal tax rates (Bakija and Heim

618).

The raw data imply that states with higher income levels (New Jersey, New York,

Connecticut, Massachusetts, etc.) have lower average contributions. However, this relationship

may result from a difference in marginal tax rates. New Jersey and New York, in particular, have

higher marginal tax rates on income, while more charitable states such as Texas and Tennessee

do not even have a personal income tax. Examination of IRS income tax data supports the claim

in Bakija and Heim (2011) that tax incentives play a significant role in driving charitable actions.

The IRS Statistics of Income Bulletin depicts a gap in charitable giving between individuals in

high-income and low-income states. For 2011, the observations for Tennessee (low-income)

show an average Adjusted Gross Income (AGI) of $48,232 while an average itemizer contributed

an impressive $5,178 to charity. In contrast, Connecticut had the highest average AGI of $83,608

while the average itemizer contributed $3,545. The difference was even more pronounced in New Jersey. The average itemizer in New Jersey had an average AGI of $73,514 and an average contribution of only $2,827. However, Tennessee has less generous welfare programs in comparison to Connecticut and New Jersey.

While the raw data indicate that lower-status individuals in states such as Mississippi and Tennessee are more generous and higher-status individuals in New York and Connecticut are less generous, it is unclear whether status causes people to donate or people donate in order to gain status. Bracha, Heffetz, and Vesterlund (2009) attempts determine whether high-status individuals donate more as a result of their endowment with status, or whether *status-seeking* individuals donate in order to gain status. To isolate the impact of status seeking on donations, this study examines the impact of peer pressure and the desire for social acceptance on charitable giving.

In Bracha, Heffetz, and Vesterlund (2009), groups of 6 individuals were assigned to 4 testing categories where each person was compensated according to their individual math aptitude (exogenous) and given the opportunity to donate to a worthy cause (endogenous). Performance visibility on the math test varied across amongst the categories. The purpose of this variation was to "separately identify the effects of exogenous and endogenous status on charitable giving" (Bracha, Heffetz, and Vesterlund 3). In condition 1, participants were told what others earned and what they donated while in condition 2 participants were told what others earned but not what they donated. In condition 3, participants were told what others donated but not what they earned, while in condition 4 participants did not receive any information regarding the earnings or donations of others. Comparing donations in condition 1 and 2 reveals that "Performance-visibility causes a [statistically] significant increase in the donation shares of high-

performers from 0.20 to 0.29 while decreasing the donation shares of low-performers from 0.27 to 0.21. However, the decrease was not statistically significant" (Bracha, Heffetz, and Vesterlund 13).

Warr (1982) contends that government support of charitable organizations will crowd out private donations. Because governments derive their revenue through taxation, tax rates would be a notable proxy for measuring a potential crowding out effect and minimizing the likelihood of omitted variable bias within any particular model. According to Andreoni (2007), most studies show that such crowding out is near zero and sometimes even negative. Andreoni (2007) attempts to quantify the impact of tax policy in relation to charitable giving. He begins by questioning why self-interested individuals may sacrifice a significant portion of their income to donate to a cause that offers them no direct benefit. He finds most individuals experience a level of private utility through charitable giving.

Bakija, Gale, and Slemrod (2003) analyzes the actual relationship between the average charitable contributions of itemizers in each state against the marginal tax rates of each state. While only high income taxpayers will pay the marginal rate, these are precisely the taxpayers who are more likely to itemize (thus quantifying their actual charitable contributions). They find that the "wealth elasticity" of giving is around 1.5, and changing marginal tax rates can have a statistically significant impact on giving.

III. METHODS

To test whether the recession changed the determinants of charitable giving, we assemble annual state-level data for 1995 to 2011. There are observations for all 50 states (DC excluded) in each year. We compare the determinants of charitable donations before and after the onset of the Great Recession in December of 2007. The dependent variable is the average contribution of

itemizers in each state for each year from 1995 to 2011 (*gdpavgitemcont*). The observations for

the average contributions of itemizers only account for the taxpayers who actually itemized their

deductions. The figures for *gdpavgitemcont* in each year are denoted in 2011 dollars and the

adjustments are made using the GDP deflator. The dependent variable is tested under 3 major

scenarios, including for all 17 years (1995-2011), pre-recession (1995-2007), and post-recession

(2008-2011). The regressions are run under different scenarios to test for structural shifts in the

statistically significant determinants of charitable giving which occurred after the onset of the

Great Recession.

The aggregate contribution figures for each year (*gdpavgitemcont*) are likely to exclude

low-income individuals with little incentive to itemize. While it would be preferable to

incorporate the average charitable contributions of all donors collectively on a state-by-state

basis, this data was unfortunately not available. The readily available data on the average

contributions of itemizers who can quantify their charitable contributions in their tax returns

should nevertheless serve as a close proxy for establishing statistically significant causal

relationships within the multivariate regression analysis. A model with a semi-log specification

may help capture non-linear changes in charitable giving as well.

The yearly data for the average adjusted gross income (AGI) in each state was gathered

from the Internal Revenue Service (IRS) website. To account for inflation, the data was adjusted

by converting all dollar figures in 2011 dollars using the GDP Deflator, identical to the treatment

applied for all observations in the dependent variable. This ensures consistency across both the

independent and dependent variables so the relationship between income (*gdpavgagi*) and

charitable contributions can be isolated. Given the preliminary observations between more

charitable and less charitable states, it appears that there will be a negative relationship between the two factors.

Unemployed individuals often rely on the assistance of charities in addition to unemployment benefits. Fortunately, there is very detailed data about the unemployment rates, including state-level data for each of the years within the panel data set. The data for unemployment rates (*unemployment*) in each observation was obtained using an interactive feature on the Bureau of Labor Statistics website. We use the January unemployment rate for each state for each of the 17 years in the time period from 1995 to 2011.

A preliminary observation reveals that the most charitable states also have significantly higher levels of poverty (e.g., Alabama, Louisiana, etc.). Poverty data is from the Current Population Survey, conducted annually by the U.S. Bureau of the Census. The Federal government has set income thresholds based on income levels and family size when measuring nationwide poverty, and this measure is consistently applied nationwide based on the established figures for a given calendar year. Poverty rates (*poverty*) may provide another close proxy for estimating charitable generosity when attempting to identify the main drivers of charity.

Higher income states often have lower levels of charitable contributions, even if more individuals have the means to contribute. The regression includes income levels on a state-by-state basis in relation to the average contribution of itemizers. The regression includes the state and federal marginal income tax rates for a hypothetical individual earning $1,501,000 in each calendar year from 1995 to 2011 (*statemartax and fedmartax*). The figure for *fedmartax* in each year assumes that an individual is itemizing their deductions and accepting a deduction for state taxes paid.

8

As mentioned in Bakija and Heim (2011), governments can incentivize charitable contributions by permitting filers to deduct their contributions towards eligible organizations. Most states which levy a tax on income also allow for the deductibility of donations. The deductions generally apply to individuals who itemize their tax deductions, and those individuals are also more likely to be affected by the marginal tax rate in their respective jurisdiction. The effectiveness of these tax incentives may be questionable because states with significantly higher marginal tax burdens tend to be less charitable than states with lower marginal tax burdens. These tax rates are obtained from a National Bureau of Economic Research (NBER) table denoting the top federal (*fedmartax*), state (*statemartax*), and combined tax burdens of a hypothetical individual earning a nominal income of $1,501,000. The figures allow for the cross deduction of tax rates where appropriate. Accounting for the deductibility of state tax liabilities on Federal tax filings, the marginal Federal burden is adjusted in each state that happens to levy an income tax to a rate below the top marginal figure.

The data for the changes in the S&P 500 was found using Yahoo Finance. The regression has a lagged variable which measures annual changes in the S&P 500 as opposed to changes in the average charitable contributions of itemizers. The opening prices for the S&P 500 were taken for each year from 1994 to 2011, and a one-year lag was calculated on the percentage changes in the opening prices from 1995 to 2011*(spyearopenlag)*. The subsequent two regressions test for structural shifts as well, since the Great Recession of 2007 led to a precipitous drop in the S&P 500 index in September of 2008.

IV. RESULTS

Table 1 defines the descriptive statistics for each independent variable across all time periods (1995 to 2011). From Table 1, we see that the average contributions of itemizers across

9

all time periods denoted in the 2011 base year is $3900.00, while the average adjusted gross income is $54,069.19 across the United States. The average state unemployment rate is 5.3%, the average state poverty rate is 12.79%, the average state has a marginal income tax rate of 5.19%, and the average Federal marginal tax rates of people across states is 36.01% in the entire 17-year time frame. The dependent variable (*gdpavgitemcont*) measures the average charitable contribution of United States taxpayers who elect to itemize their tax deductions in each state for each year from 1995 to 2011.

Table 2 shows the same descriptive statistics for each independent variable across pre-recession time periods (1995 to 2007) while Table 3 analyzes the descriptive statistics for the post-recession time periods (2008 to 2011). Tables 2 and 3 measure for structural shifts from the Great Recession denoted by changes in statistical significance and coefficient signs in the determinants of the dependent variable (*gdpavgitemcont*). In the pre-recession time period, the mean lag percentages for the S&P 500 were 10.42%, in sharp contrast to the mean of 0.33% in the post-recession time period. In inflation-adjusted terms, the average adjusted gross income levels were similar ($53,641 versus $55,460) across both time periods. The rates for state and federal marginal taxation levels are also similar. As expected, the post-recession time period shows a rise in mean poverty levels (14.1% versus 12.4%) and mean state unemployment rates (7.3% versus 4.7%).

To test for differences in giving behavior pre- and post-recession, we regress average itemized contributions (*gdpavgitemcont*) on the independent variables described above. Because tests indicate the presence of autocorrelation, we use a panel autoregressive procedure. We also control for fixed effects. Table 4 displays 3 regressions, an analysis of all 17 years (1995 to 2011- column 1), pre-recession years (1995 to 2007- column 2), and post-recession years (2008

10

to 2011-column 3). It is interesting to note that the regression in column 1 shows that 5 of the 6 independent variables are statistically significant at the 90% confidence level or higher. State marginal tax is the only independent variable that is not statistically significant across all three columns.

Despite the lack of significance in regards to state-level taxation, the federal marginal tax rate is highly significant ($t = 7.47$). The estimate indicates that a one percentage-point increase in the federal marginal tax rate raises average itemized contributions by about $75. In addition, the unemployment rate, the lagged one-year percentage change in the S&P 500, and average adjusted gross income are statistically significant at the one percent level. These estimates imply that a one percentage-point increase in the state unemployment rate causes a $4007.02 decrease in average itemized charitable contributions, a one percent change in the S&P index causes average itemized contributions to increase by $279, and a $1000 increase in average adjusted gross income raises average itemized contributions by $44. Finally, the poverty rate is significant at the 10% level. This estimate suggests that one percentage-point increase in the poverty rate causes a $2644 increase in average itemized contributions.

While these variables in the first regression are sufficient to establish statistically significant relationships about the main determinants of charitable giving across a the entire time period, the analysis does not capture any changes in the relation between independent variables and average itemized contributions that may have occurred as a result of the Great Recession which began in December of 2007. Since millions of Americans rely on the generosity of charity during an economic downturn, it is important to determine whether or not the Great Recession led to change in the determinants of charitable giving amongst itemizers. Importantly, Tables 2

11

and 3 show a significant increase in unemployment and poverty rates after the onset of the recession.

Given the potential for structural shifts from the onset of the Great Recession in 2007, we run two additional regressions with the same 6 independent variables. The first regression, reported in column 2, tests for the pre-recession years (1995 to 2007) and the second regression, reported in column 3, tests for the post-recession years (2008 to 2011). These findings are important because the test for structural shifts reveal changes in statistical significance in the pre and post-recessionary time periods, along with changes in the beta coefficient signs. The coefficient for the S&P 500 percentage changes is positive and significant at the one percent level ($t = 2.9603$) in the pre-recession time period, while the coefficient is negative post-recession and statistically insignificant. During the pre-recession period a one-percent change in the S&P index causes average itemized contributions to rise by $237. It may be that donors did not see changes in the S&P following the recession as indicators of changes in long-term wealth and therefore did not gauge donations based on changes in the S&P.

The average adjusted gross income figures are highly significant in all 3 regressions at the 1% level, and the sign is the same in the pre- and post-recession time period. In the pre-recession period, a $1000 increase in average adjusted gross income raises average itemized contributions by $46 while in the post-recession period, and a $1000 increase in average adjusted gross income raises average itemized contributions by $70. Given these findings, a statistical test comparing the slopes for two independent samples is conducted to determine whether the column 2 estimates are significantly different from the column 3 estimates. We find the pre-recession regression estimates are not significantly different from the post-recession estimates ($t = 1.01$). These findings lead to the conclusion that an increase in average adjusted gross income

is positively related to charitable generosity, contradicting the initial prediction that higher income levels will lead to lower charitable generosity. These findings are consistent in both economic environments.

Since the Great Recession brought about a rise in unemployment and poverty rates, a test of these independent variables reveal different outcomes in the pre- and post-recession time periods. Unemployment rates are significant at the 1% level across all 3 columns, but the coefficient is negative and significant in the pre-recession interval and positive and significant in the post-recession interval. In the pre-recession period, a one percentage-point increase in the state unemployment rate causes a $7450 decrease in average itemized charitable contributions while in the post-recession period, a one percentage-point increase in the state unemployment rate causes a $9667 increase in average itemized charitable contributions. It may be that donors viewed higher unemployment rates following the recession as a better indicator of hardship than prior to the recession. Prior to the recession, high unemployment rates might be more likely conjure images of individuals unwilling to acquire the necessary skills to gain employment.

In a similar way, views of the poverty rate as an indicator of hardship may also have shifted as a result of the recession. Across all 17 years, the poverty rate has a significant positive effect of average itemized contributions. However, the estimates in column 2 show that poverty rates have no statistically significant effect on average itemized contributions. The estimates in column 3 show that following the recession a one-percentage point increase in the poverty rate causes an $11384 increase in average itemized contributions.

Finally, federal marginal tax rates are statistically significant across for the entire data set and in the pre-recession years. Following the recession, the federal marginal tax rate does not have a statistically significant effect on average itemized contributions. From column 2, we see

that a one percentage-point increase in the federal marginal tax rate raises average itemized contributions by about $55. This implies that prior to the recession donors were more sensitive to the marginal tax rate than they were following the recession. This may be because capital losses following the recession reduced the need for tax deductions from charitable giving.

V. CONCLUSION

The Great Recession of 2007 led to significant shifts within the market for charitable giving. In the time frame prior to the recession (1995 to 2007), homeowners consistently benefited from rising housing prices and an overall rise in their stock market holdings. Charitable contributions were further incentivized by Federal tax deductions and an increase in disposable income levels. After the onset of the recession in December of 2007 and the stock market crash in September of 2008, most itemizing taxpayers experienced a decline in their net worth along with their overall sense of economic security. These changes are quantified through three separate regressions testing for structural shifts.

We find evidence that the changes in the S&P 500, average adjusted gross income, the unemployment rate, the poverty rate, and the federal marginal tax rate are statistically significant determinants of average itemized charitable contributions in a 17-year time period from 1995 to 2011. However, the onset of the Great Recession in 2007 caused important changes in the determinants of average itemized charitable contributions. Prior to the Recession, changes in the S&P 500 returns, average adjusted gross income, and federal marginal taxes were positively related to charitable generosity while the unemployment rate was negatively related to average itemized charitable contributions. After the Recession, the unemployment rate shows a positive relation (rather than a negative relation), the change in the S&P 500 loses statistical significance,

the poverty rate gains statistical significance, and the federal marginal tax rate loses statistical significance.

The results suggest that donors became much more concerned with alleviating hardship following the recession of 2007. It may be that donors viewed higher unemployment and poverty rates following the recession as a better indicator of hardship than prior to the recession. Prior to the recession, high unemployment and poverty rates might have been more likely conjure images of individuals unwilling to acquire the necessary skills to gain employment. Moreover, it may be that donors did not see changes in the S&P 500 following the recession as indicators of changes in long-term wealth and therefore did not gauge their donations based on changes in the S&P 500. The reduced response to the federal marginal tax rate following the recession may be because capital losses following the recession reduced the need for tax deductions from charitable giving.

A worthy topic for further study would be to assess whether the relationships between the independent variables and average itemized charitable contributions we find for the post-recession years eventually returns to the relationships we find for the pre-recession years. Of course, such an analysis would require additional years of data. Annual state-by-state data on religiosity could lead to addition insights. If annual data on the religious affiliation of Americans is readily available, it would enable economists and policymakers to more accurately understand the sectarian influences on average itemized charitable contributions.

Since the actual data in the regression only accounts for the contributions of itemizers, a more comprehensive study which accounts for all individual contributors to the $335.17 billion charitable donation industry would more precisely quantify the relationships between, income levels, unemployment, poverty, and taxation policies and charitable giving. Based on the

recessionary structural shifts, a more comprehensive study on the determinants of charitable generosity during recessionary and expansionary economic time periods is warranted. Since the pre-recession data shows a positive relationship between tax rates and individual generosity, the federal government should exercise caution when considering proposals to change tax rates or expand social welfare programs.

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Table 1: Means and Standard Deviations for Independent Variables (All Years)

Variable	N	Mean	Standard Deviation	Min	Max
gdpavgitemcont[a]	850	3900.003	1095.026	1942.507	11430.07
spyearopenlag[b]	850	0.0804554	0.1961589	-0.3848716	0.3412818
gdpavgagi[c]	850	54069.19	9150.208	36559.68	89926.44
unemployment[d]	850	0.0535224	0.0190846	0.023	0.137
poverty[e]	850	0.1278776	0.0331865	0.053	0.253
statemartax[f]	850	0.0519331	0.029469	0	0.1166
fedmartax[g]	850	0.3601518	0.0263785	0.3115	0.4079

[a] GDP Deflator Adjusted Average Contribution of Itemizers = The average itemizing taxpayer's charitable contributions in each state for each calendar year from 1995 to 2011, all adjusted for 2011 dollars.

[b] S&P 500 Year Open Lag = A 1-year lag between the opening price of the S&P 500 for year (*n*) and year (*n-1*), measured as a percentage change.

[c] GDP-Deflator Adjusted Average Gross Income = The average filer's adjusted gross income in each state for each calendar year from 1995 to 2011, all adjusted for 2011 dollars.

[d] Unemployment Rate = The January unemployment rate in each state for each year from 1995 to 2011, measured as a percent by the Bureau of Labor Statistics.

[e] Poverty Rate = The percentage of individuals in each state living in a household with a pretax income level below the established Federal poverty threshold for each respective year from 1995 to 2011, excluding welfare, private charity, and other forms of wage subsidies.

[f] State Marginal Tax Rate = The percentage of pretax income solely owed in the form of State taxes for a hypothetical individual earning $1,501,000 for each respective calendar year from 1995 to 2011.

[g] Federal Marginal Tax Rate = The percentage of pretax income solely owed in the form of Federal taxes for a hypothetical individual earning $1,501,000 in each state from 1995 to 2011, assuming a Federal income tax deduction for state income taxes paid (or lack thereof).

Table 2: Means and Standard Deviations for Independent Variables (Pre-Recession)

Variable	N	Mean	Standard Deviation	Min	Max
gdpavgitemcont[a]	650	3977.085	1121.3	1942.507	11430.07
spyearopenlag[b]	650	0.1041959	0.175766	-0.2336597	0.3412818
gdpavgagi[c]	650	53641.15	9305.523	36559.68	89926.44
unemployment[d]	650	0.0474277	0.0116669	0.023	0.08
poverty[e]	650	0.1238662	0.0324529	0.053	0.253
statemartax[f]	650	0.0521317	0.0294829	0	0.1166
fedmartax[g]	650	0.3682591	0.0244287	0.3225	0.4079

[a] GDP Deflator Adjusted Average Contribution of Itemizers = The average itemizing taxpayer's charitable contributions in each state for each calendar year from 1995 to 2007, all adjusted for 2011 dollars.
[b] S&P 500 Year Open Lag = A 1-year lag between the opening price of the S&P 500 for year (*n*) and year (*n-1*), measured as a percentage change.
[c] GDP-Deflator Adjusted Average Gross Income = The average filer's adjusted gross income in each state for each calendar year from 1995 to 2007, all adjusted for 2011 dollars.
[d] Unemployment Rate = The January unemployment rate in each state for each year from 1995 to 2007, measured as a percent by the Bureau of Labor Statistics.
[e] Poverty Rate = The percentage of individuals in each state living in a household with a pretax income level below the established Federal poverty threshold for each respective year from 1995 to 2007, excluding welfare, private charity, and other forms of wage subsidies.
[f] State Marginal Tax Rate = The percentage of pretax income solely owed in the form of State taxes for a hypothetical individual earning $1,501,000 for each respective calendar year from 1995 to 2007.
[g] Federal Marginal Tax Rate = The percentage of pretax income solely owed in the form of Federal taxes for a hypothetical individual earning $1,501,000 in each state from 1995 to 2007, assuming a Federal income tax deduction for state income taxes paid (or lack thereof).

Table 3: Means and Standard Deviations for Independent Variables (Post-Recession)

Variable	N	Mean	Standard Deviation	Min	Max
gdpavgitemcont[a]	200	3649.488	965.7707	2074.873	7453.291
spyearopenlag[b]	200	0.0032987	0.2357615	-0.3848716	0.2365142
gdpavgagi[c]	200	55460.34	8500.305	40932	86012.78
unemployment[d]	200	0.07333	0.0243789	0.026	0.137
poverty[e]	200	0.140915	0.0322573	0.076	0.226
statemartax[f]	200	0.0512875	0.0294887	0	0.11
fedmartax[g]	200	0.333803	0.0104865	0.3115	0.3535

[a] GDP Deflator Adjusted Average Contribution of Itemizers = The average itemizing taxpayer's charitable contributions in each state for each calendar year from 2008 to 2011, all adjusted for 2011 dollars.
[b] S&P 500 Year Open Lag = A 1-year lag between the opening price of the S&P 500 for year (*n*) and year (*n-1*), measured as a percentage change.
[c] GDP-Deflator Adjusted Average Gross Income = The average filer's adjusted gross income in each state for each calendar year from 2008 to 2011, all adjusted for 2011 dollars.
[d] Unemployment Rate = The January unemployment rate in each state for each year from 2008 to 2011, measured as a percent by the Bureau of Labor Statistics.
[e] Poverty Rate = The percentage of individuals in each state living in a household with a pretax income level below the established Federal poverty threshold for each respective year from 2008 to 2011, excluding welfare, private charity, and other forms of wage subsidies.
[f] State Marginal Tax Rate = The percentage of pretax income solely owed in the form of State taxes for a hypothetical individual earning $1,501,000 for each respective calendar year from 2008 to 2011.
[g] Federal Marginal Tax Rate = The percentage of pretax income solely owed in the form of Federal taxes for a hypothetical individual earning $1,501,000 in each state from 2008 to 2011, assuming a Federal income tax deduction for state income taxes paid (or lack thereof).

Table 4: Regressions

	All Years	Pre-Recession	Post-Recession
	(1)	(2)	(3)
Constant	-1462.566***	-739.041	20900.2
	(363.188)	(484.4879)	(27275.1)
spyearopenlag	279.6046***	236.6746***	-540.153
	(56.11158)	(79.94874)	(467.4465)
gdpavgagi	0.0440478***	0.046705***	0.0701929***
	(0.0057992)	(0.0064736)	(0.0223429)
unemployment	-4001.017***	-7449.846***	9667.358***
	(1277.696)	(2406.991)	(3821.623)
poverty	2643.575*	2382.204	11383.62***
	(1436.605)	(1617.103)	(4246.052)
statemartax	4439.94	5570.702	-21392.51
	(3402.702)	(5381.849)	(28637.33)
fedmartax	7467.008***	5548.038***	-67502.34
	(999.7295)	(997.7049)	(79135.81)
R^2	0.0051	0.0002	0.0001
N	800	600	150

*Significant at 0.1 level; **Significant at 0.05 level; ***Significant at 0.01 level.
Standard errors in parentheses